Speed to Market

Fast Track Project Implementation

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- Introduction / Overview
- Why the Need for Speed?
- How Do I Go Fast?
  - Design – Bid – Build with Early Procurement
  - Construction Manager
    (CM at Risk or CM Agent)
  - Design – Build
- What is Different? / How Do I Do It?
  - Compare and contrast the methods
- Case Studies
  - Purdue University – Chiller Replacement
  - Enwave – Biomedical District Steam Plant
  - Airbus – Powerhouse
- Questions & Answers
Why the Need for Speed?
Why the Need for Speed?

• **Seasonal Business**
  – Need to meet peak demands
  – Winter (heating demand) and Summer (cooling demand) come every year
  – Shortening a project by a few months can add a year of “service”

• **Not Enough Implementation Time**
  – Equipment failure
  – New customer needs load quickly
  – Delayed decision to execute the project

• **Minimize Plant Disruption**

• **It’s Fun to Go Fast**
How Do I Go Fast?
&
What is Different?
How Do I Go Fast?
Early Equipment Procurement

- **How Do I Do It?**
  - Specification developed for long-lead items
  - Owner reviews bids and places equipment order
  - Shop drawings for equipment come to owner
  - Delivery of equipment can be to Owner or Contractor

- **What is Different?**
  - Can drastically reduce schedule
  - Provides early detailed equipment information
  - Adds to the contracts to administer
  - Owner is responsible for coordination between contracts
    - Scope
    - Delivery
    - Warranty
• Two major types:
  – Construction Manager Agent
  – Construction Manager at Risk

• Procured via:
  – Request for Qualifications (RFQ)
  – Request for Proposal (RFP)
  – Other method

• Responses can include:
  – Construction fee
  – Pre-construction services
  – General conditions
  – Staffing plan
  – Schedule
  – Change order markup fee
DBB vs. CM & Design-Build

What is Different?

**Design & Bid**
- No Project Contractor Involvement

**Construction**

- Design-Bid-Build

**Overlapped design & construction**

**Design & Bid**

- Extensive Contractor Involvement Possible

**Construction**

- Design-Build CM-at-Risk
D-B-B vs. Design-Build

What is Different?

Design-Build Utilizing Open Book Approach

- Scope & Criteria
- Prelim Design
- Final Design
- Pre-Construction Services
- Construction

GMP Established

Time & Dollars Saved

Traditional Design-Bid-Build Approach

- Scope & Criteria
- Prelim Design
- Final Design
- Bid
- Construction

Final Cost Determined

If project over budget—Redesign and Re-bid
**Design-Build**

**How Do I Do It?**

### Usually Best Value or Qualifications

- **Direct Design-Build**
  - -10% to 5%

- **Design Criteria**
  - 5% to 20%

### Typically Low-Bid Procurement

- **Preliminary Engineering**
  - Design-Build
  - 20% to 35%

- **Best Value (BVS) with Technical & Price Emphasis**
- **Best Value (BVS) with Low Bid Emphasis**

- **Design/Draw-Build**
  - 35% Design or Greater
Design-Build
How Do I Do It?

Documents less than 100% complete

RFP
Tech Proposal
Price Proposal
= Contract
Plans
Specs
## Project Delivery Methods

**CII/Penn State University Study**

<table>
<thead>
<tr>
<th>Metric</th>
<th>DB vs. DBB</th>
<th>CM@R vs. DBB</th>
<th>DB vs. CM@R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Cost</td>
<td>6.1% lower</td>
<td>1.6% lower</td>
<td>4.5% lower</td>
</tr>
<tr>
<td>Construction Speed</td>
<td>12% faster</td>
<td>5.8% faster</td>
<td>7% faster</td>
</tr>
<tr>
<td>Delivery Speed</td>
<td>33.5% faster</td>
<td>13.3% faster</td>
<td>23.5% faster</td>
</tr>
<tr>
<td>Cost Growth</td>
<td>5.2% less</td>
<td>7.8% more</td>
<td>12.6% less</td>
</tr>
<tr>
<td>Schedule Growth</td>
<td>11.4% less</td>
<td>9.2% less</td>
<td>2.2% less</td>
</tr>
</tbody>
</table>
Case Studies
Purdue University - Chiller Replacement

Early Equipment Procurement

• Project Description
  – Remove 6,250 ton steam turbine
  – Install two 3,700 ton chillers
  – Increase total capacity by 1,150 tons
  – Increase firm capacity by 2,400 tons

• Schedule
  – Design Start: October 2013
  – Construction Start: September 2014
  – Completion: May 2015

• Project Attributes
  – Early chiller procurement
  – 8,000 ton temporary chiller connection
  – Meet demand for:
    • Temporary Connections May 2014
    • Permanent Capacity May 2015
**Purdue University - Chiller Replacement**

**Early Equipment Procurement**

- **Schedule with D-B-B**
  - May 2014: Issue for Bid
  - July/Aug 2014: Approval from Board of Trustees (Award to Contractor)
  - Sept/Oct 2014: Approval of chiller shop drawings / place order
  - Jan/Feb 2015: Chiller Delivery
  - Mar/Apr 2015: Installation
  - May 2015: Commissioning
  - June 2015: Project Complete

- **Schedule with Early Procurement**
  - Dec 2013: Chiller bids received
  - May 2014: Issue Construction for Bid / Chiller order place
  - July/Aug 2014: Approval from Board of Trustees (Award to Contractor)
  - Fall 2015: Chiller Delivery
  - Mar/April 2015: Commissioning
  - April/May 2015: Project Complete

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2 months saved
Enwave - Biomedical District Steam Plant

Design-Build

• Project Description
  – 210,000 PPH steam
  – 900 kW generation

• Schedule
  – Start: October 2013
  – Completion: January 2015

• Project Attributes
  – Designed to accommodate 20 foot flood waters
  – Precast Concrete façade designed to withstand 150 mph winds
  – 7 days stand alone island operation
Enwave - Biomedical District Steam Plant

Design-Build

• Process
  – Originally Design-Bid-Build
  – Converted to D-B near the end of design
  – D-B-B schedule and D-B project schedule are nearly identical

• Lessons Learned
  – Earlier conversion to design-build decreases construction schedule
  – D-B contract has allowed for incorporation of changes during construction w/o modifying the schedule

Limited time saved
Airbus – Powerhouse
Design-Build

• Project
  – New plant to produce A320 in US
  – Located in Mobile, Alabama

• Schedule
  – RFQ Dec 2012
  – RFP Issued Jan 2013
  – Project Complete July 2014

• Procurement Process
  – Initially DBOOM
  – Revised to DBOM (own was removed)
  – Design-Build Construction
    • Performance Specifications from Airbus
    • Lump sum GMP to plant operator
    • Mechanical and electrical sub-contractors selected at RFQ stage
Airbus – Powerhouse

Design-Build

• Project Attributes
  – LEED Gold Certification (LEED Silver target)
  – CUP expands with manufacturing
  – Tempered equipment bays
  – Closed automatic transition switchgear and controls

• Capacities
  – 4,200 tons chilled water
  – 44 MMBH heating water production
  – 2000 SCFM compressed air
  – Emergency Standby Power

• Schedule
  – Awarded  June 2013
  – Completion  July 2014
• **Schedule Savings**
  - D-B-B About 18-20 months
  - D-B 13 months

  5-7 months saved!

• **Best Practices**
  - Performance based requirements from Airbus
  - Early phase charrette critically important with all stakeholders
  - Early MEP sub-contractor involvement
  - M&E sub communication with engineers
  - Local City of Mobile permit coordinator
Summary

• There are Many Reasons a Project is Accelerated

• Three Methods to Accelerate
  – Early equipment procurement
  – Construction manager
  – Design-Build

• All options have pros/cons

• Design-build is the fastest

• The right solution is different for every project

Other Options:
  – Phased Construction Contracts
  – Commissioning Agents
  – Permitting Agent (expeditor)
Questions & Answers
Thank You!

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